

# 2014 INDIANA FIREWORK- RELATED INJURY REPORT

November 2014



Division of Trauma and Injury Prevention

# Indiana State Department of Health

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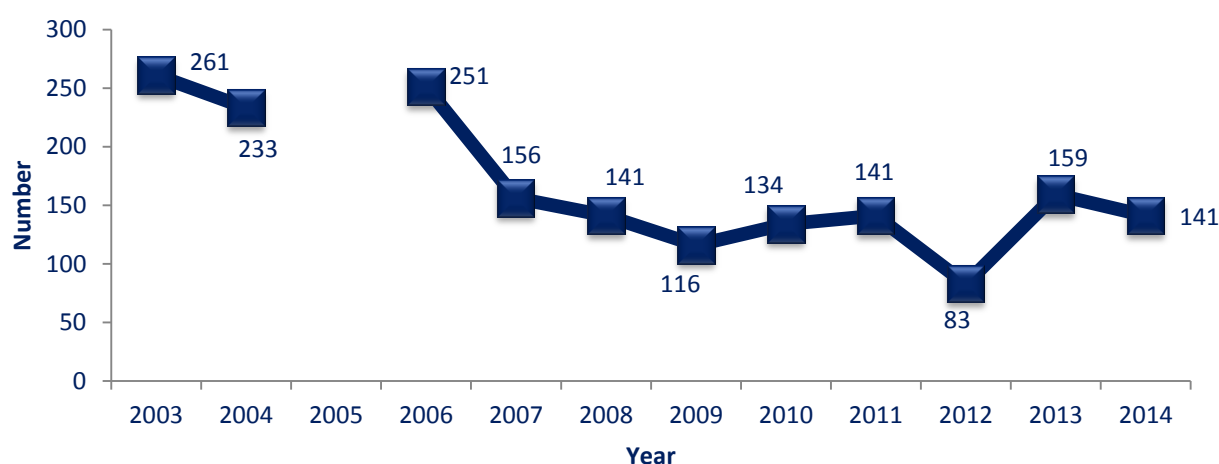
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## 2014 FIREWORK-RELATED INJURY REPORT

Due to the passage of state legislation, the Indiana State Department of Health (ISDH) received reports about injuries resulting from fireworks and/or pyrotechnics during 2003 and 2004. However, with the expiration of the law, no firework-related injury reporting occurred in 2005. The enactment of Public Law 187 and Indiana Code 35-47-7-7 in 2006 reinstated the reporting of firework-related injuries with identical reporting requirements to those in the previous statute. All hospitals, medical facilities, and private medical practices are mandated by law to report all firework injuries and deaths to ISDH; however, this law is not actively enforced and it is estimated that the number of injuries reports received is an underestimation of the true burden of fireworks injuries. This report presents firework-related injury data compiled from submitted fireworks forms for the 2014 reporting cycle (Sept. 13, 2013- Sept. 12, 2014).

**Figure 1. Firework-related injuries by reporting cycle year, Indiana, 2003–2014\***



\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention.

### 2014 Highlights

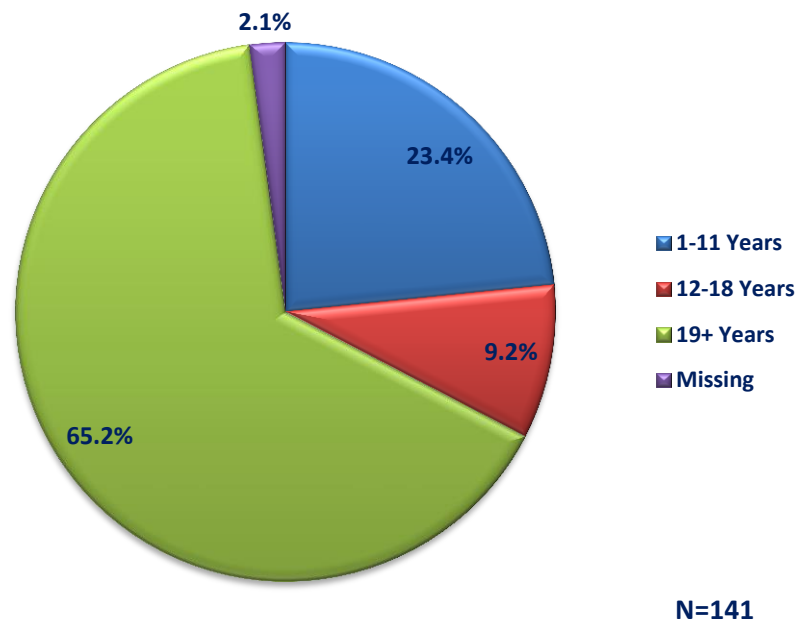
- ❑ There were 141 unduplicated cases of firework-related injuries reported to ISDH. No deaths were reported due to these injuries.
- ❑ Sixty-nine of the reported cases occurred on July 4, 2014, which represents 48.9 percent of all reported cases.
- ❑ More than a third of all reported firework-related injuries involved individuals 18 years of age and under. The youngest injured person was 8 months old.
- ❑ Thirty-seven percent of firework-related burn injuries were of the hands and/or fingers.
- ❑ Twenty-six injured persons were hospitalized or transferred to another hospital for treatment.
- ❑ Eye injuries accounted for 15.5 percent of the total number of injuries; three-quarters of the people with eye injuries did not use eye protection.
- ❑ Fifty-two percent of the injuries were caused by firecrackers, rockets, and aerials devices.
- ❑ Malfunctioning or mishandling of fireworks accounted for nearly sixty-four percent of reported fireworks injury mechanisms.
- ❑ Firework use on private property accounted for 68.1 percent of reported injury cases.
- ❑ Figure 1 indicates the number of firework-related injuries from 2003-2004 and 2006 to 2014.

## 2014 FIREWORK-RELATED INJURY REPORT

### Demographics

- ❑ The median age of persons with a firework-related injury was 25.0 years. The average age of all injured persons was 26.5 years old; ages ranged from eight months to 63 years old.
- ❑ Nearly 33 percent of those injured were 18 years of age or younger, with 23.4 percent of those injured under the age of 12 years (Figure 2).
- ❑ Across all age groups, males reported more firework-related injuries than females. Of reported injuries, 75.2 percent involved males. Two cases did not report gender. (Figure 3).
- ❑ Seventy-six percent of persons injured were white, 12.1 percent were black or African-American, and 2.8 percent were multiracial (Figure 4). Race was not known or not reported in 8.5 percent of the injury reports. White males represented 58.8 percent of cases.
- ❑ Nearly twenty-five percent of the injury reports did not record ethnicity. Of those who reported ethnicity, Hispanic ethnicity was reported in six percent of cases.
- ❑ Eighty-eight percent of injured people provided a home address in Indiana, 4.3 percent reported out of state addresses, and 7.8 percent did not provide an address. Marion, Lake, and Vanderburgh counties reported the most cases of firework-related injuries with 15, 14, and nine cases, respectively.

**Figure 2. Firework-related injuries by age group, Indiana, 2014\***

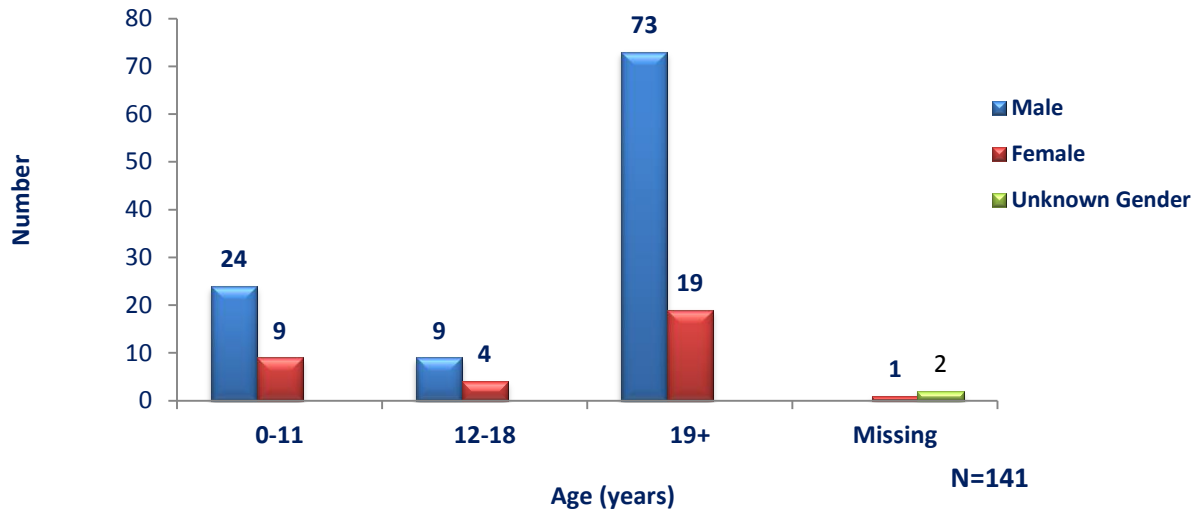


\* 2014 reporting cycle includes cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

## 2014 FIREWORK-RELATED INJURY REPORT

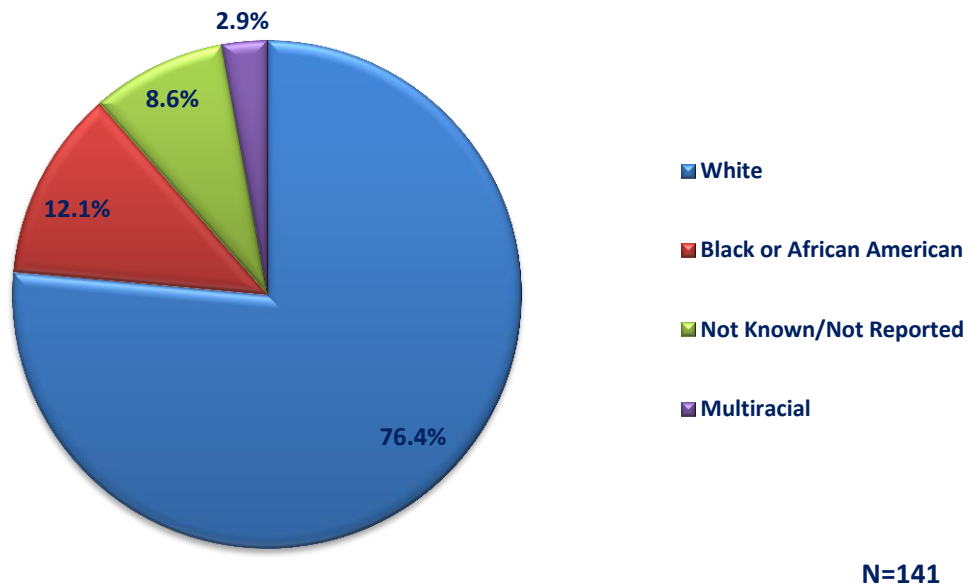
**Figure 3. Firework-related injuries by age and sex, Indiana, 2014\***



\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

**Figure 4. Firework-related injuries by race, Indiana, 2014\***



\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

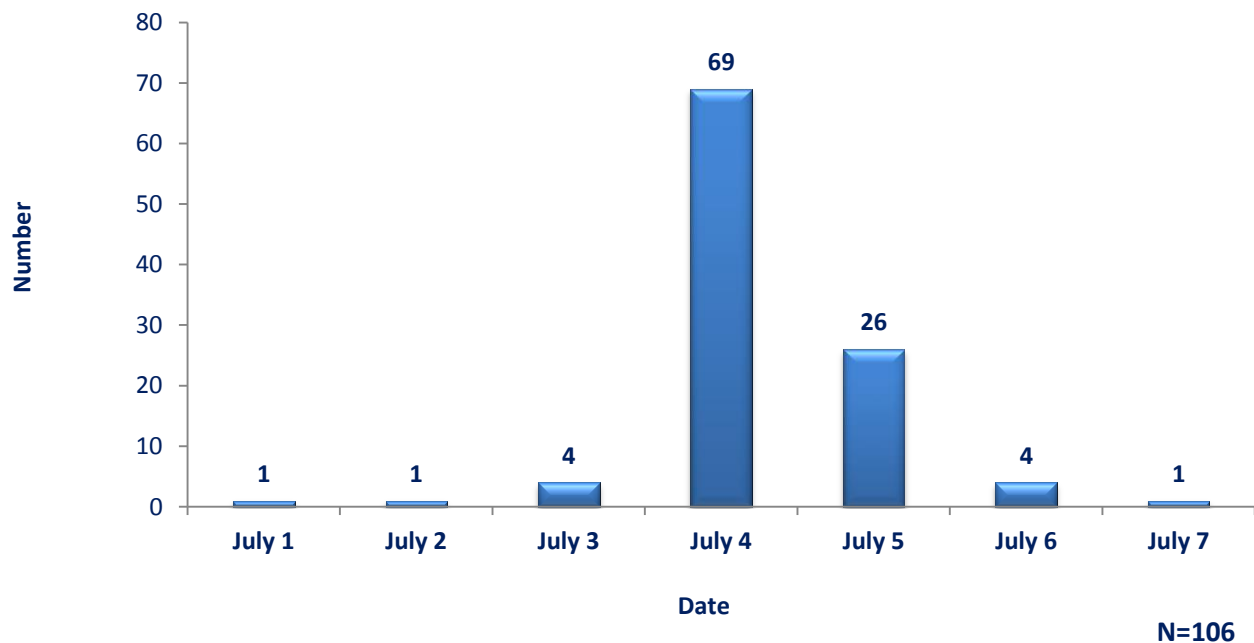
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

## 2014 FIREWORK-RELATED INJURY REPORT

### Date and Time of Injuries

- Seventy-five percent of all reported injuries in 2014 occurred from July 1–7, and 48.9 percent of all fireworks injuries occurred on July 4, 2014 (Figure 5).
- Three firework-related injuries were reported from Sept. 12 to Dec. 31, 2013. Eighteen firework-related injuries were reported from January 1 to June 30, 2014. Seven cases in 2014 occurred from July 8 to September 12. Seven cases did not have information about date of the injury.
- Fifty-six percent of reported firework-related injuries occurred between 8 p.m. and midnight, with 24 reported injuries occurring between 10–10:59 p.m. (Figure 6).
- Twenty-five cases failed to report the time of injury, of which 18 failed to report if the injury occurred in the a.m. or p.m.

**Figure 5. Firework-related injuries by date, July 1–July 7, Indiana, 2014\***

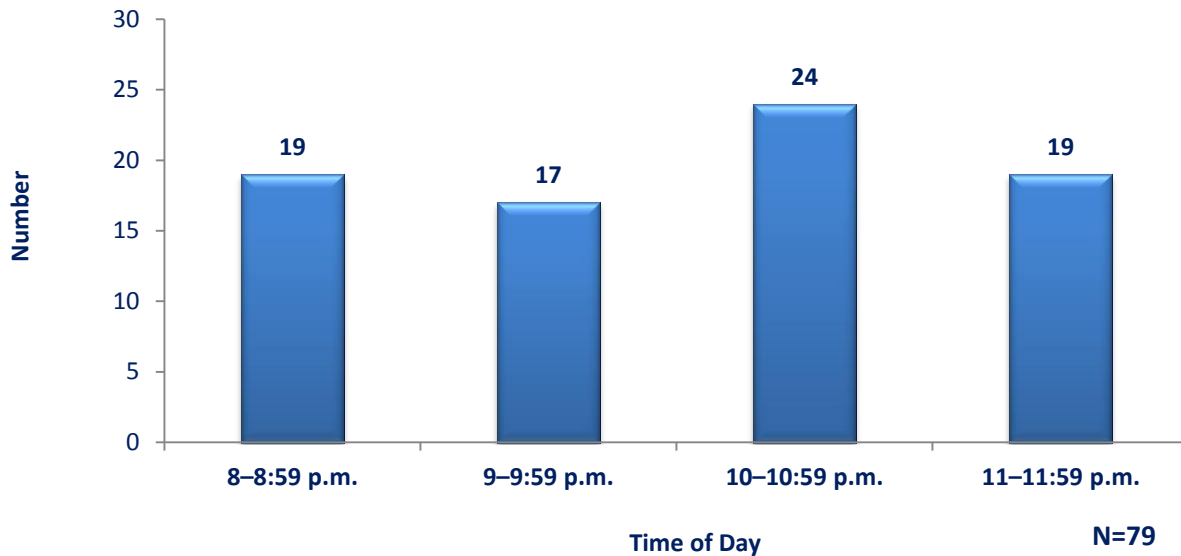


\*2014 reporting cycle included cases from Sept. 13, 2013–Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

## 2014 FIREWORK-RELATED INJURY REPORT

Figure 6. Most frequent times of day when firework-related injuries occurred, Indiana, 2014\*



\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

### Type of Fireworks Involved in Injuries

- At least 133 individuals with reported injuries were due to one firework, and five were injured by more than one firework. At least three individuals were holding more than one sparkler when injured. One individual was reportedly injured from holding numerous sparklers together to make a “sparkler bomb,” another attempted to light two or three sparklers at the same time, and one unintentionally ignited a handful of sparklers.
- Rockets, firecrackers, and aerial devices accounted for more than half (51.8 percent) of the reported injuries (Table 1).
- At least eight of the “other” types of fireworks injuries were indicated to have involved mortars, which are tube-shaped devices used as launching mechanisms for shells in aerial fireworks displays.
- Malfunctioning or mishandling of fireworks accounted for nearly sixty-four percent of reported fireworks injury mechanisms (Figure 7). For 16 reports, there was more than one cause of firework-related injury, leading to 157 causes for 141 reported injuries.

## 2014 FIREWORK-RELATED INJURY REPORT

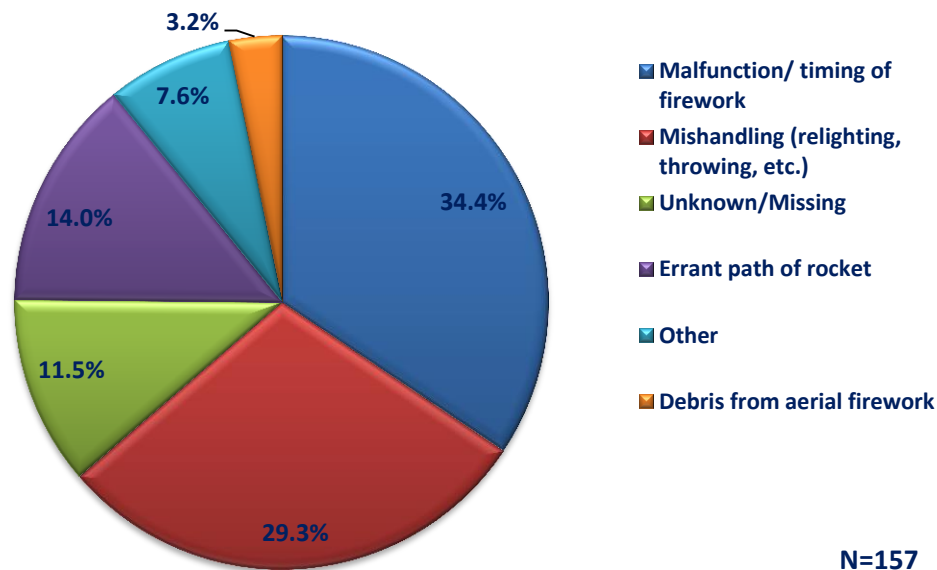
**Table 1: Frequency and Percent of Firework Type Involved in Injury, Indiana, 2014\***

Firework Type	Frequency	Percent
Rockets	29	20.6
Firecrackers	28	19.9
Other, specified	26	18.4
Sparklers	20	14.2
Aerial devices	16	11.3
Unknown	13	9.2
Lighting gunpowder	3	2.1
Twisters	3	2.1
Pyrotechnics	2	1.4
Homemade fireworks	1	0.7
<b>Total</b>	<b>141</b>	<b>100.0%</b>

\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

**Figure 7. Cause of firework-related injury, Indiana, 2014\***



N=157

\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

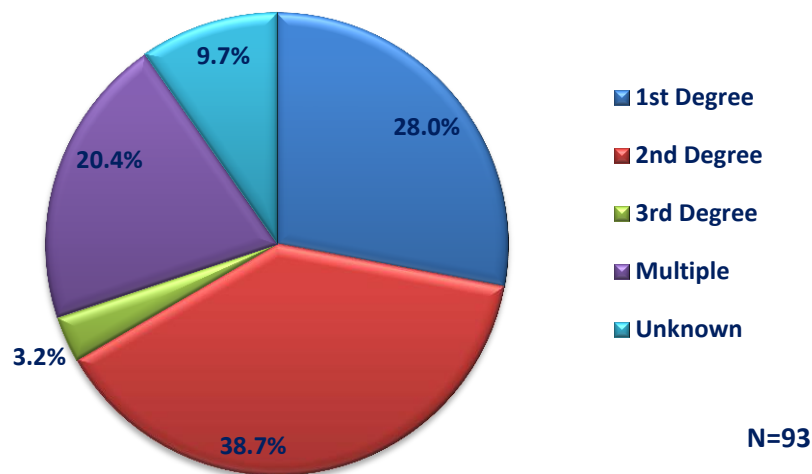


## 2014 FIREWORK-RELATED INJURY REPORT

### Type of Injuries

- During the 2014 reporting cycle, there were a total of 171 fireworks injuries that occurred among 141 individuals.
- Burn injuries were reported in 93 individuals and affected 142 body parts:
  - 26 were first-degree burns
  - 36 were second-degree burns
  - 3 were third-degree burns
  - 19 were multiple degree burns
  - 9 did not indicate degree of burn (Figure 8)
- Burns were the most commonly reported injury; thirty-seven percent of burns of the hands and/or fingers and 16.2 percent of burns were of the face, ear and head.
- Other types of injuries included contusions/lacerations/abrasions (22.8 percent), sprains/fractures (4.7 percent), penetrating foreign body/missiles (4.1 percent), other injuries (4.1 percent), puncture wounds (2.9 percent) and the injury was not known or not recorded in 7.0 percent of cases (Figure 9).
- Six injuries were documented to have resulted in amputation.

**Figure 8. Degree of burn experienced from firework-related injury, Indiana, 2014\***

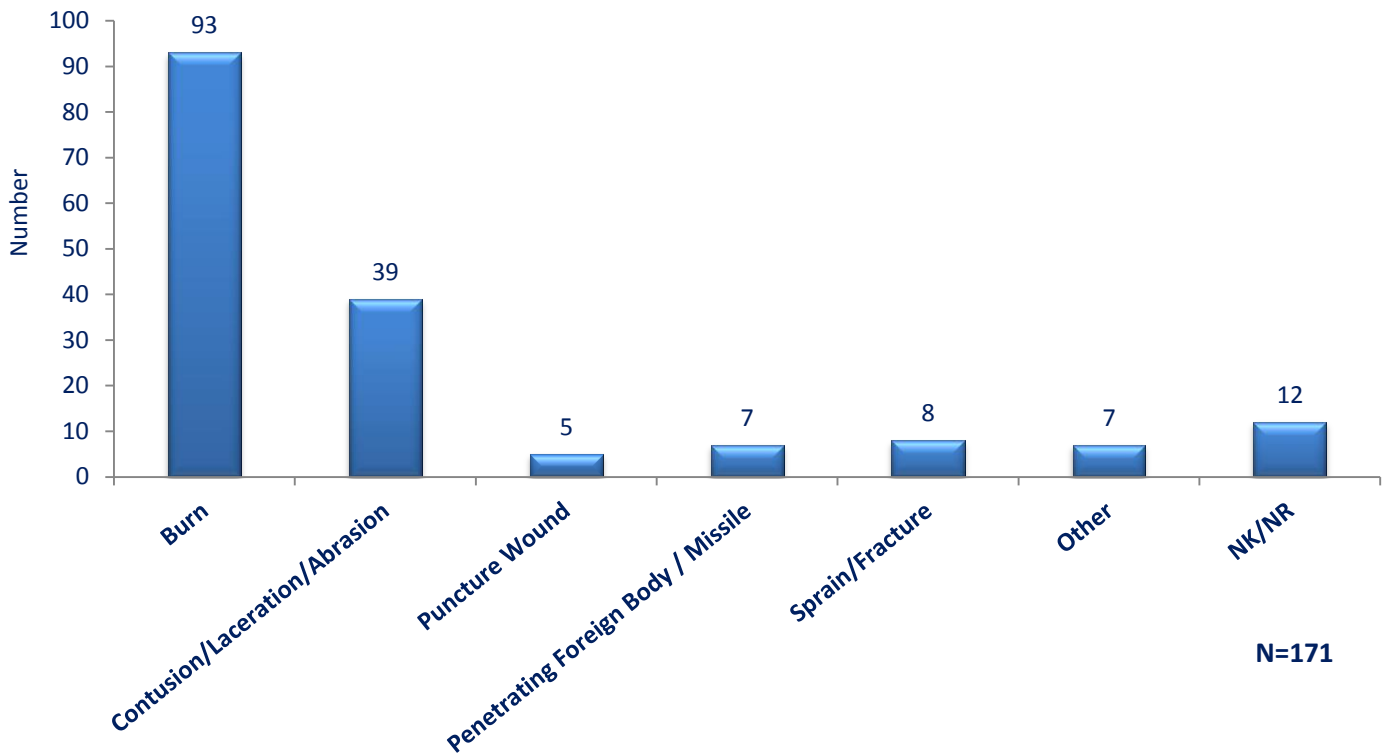


\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

## 2014 FIREWORK-RELATED INJURY REPORT

Figure 9. Type of firework-related injury, Indiana, 2014\*



\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

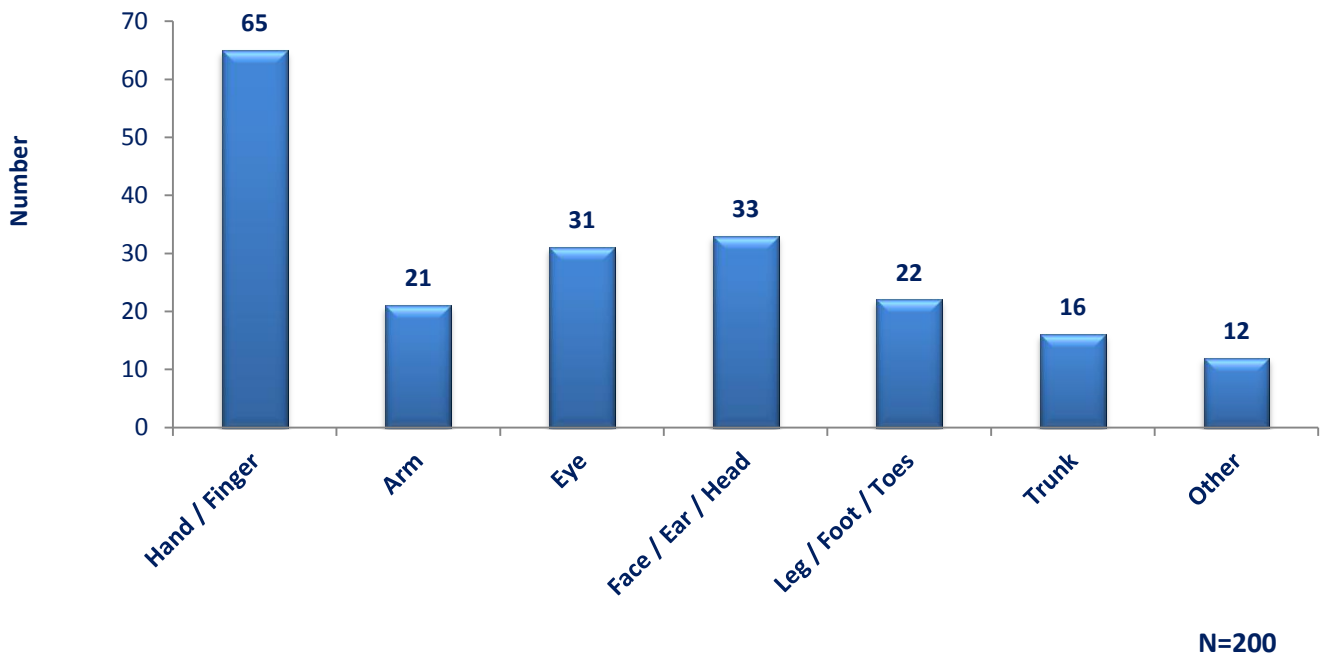
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

### Body Part Injured

- In 2014, of the 141 total cases, 38 individuals experienced injuries to multiple body parts.
- The most common type of injury was to the hand or finger (Figure 10).
  - 43.0 percent of the injuries involved the hand, finger, or arm.
  - 16.5 percent of injuries involved the face, ear or head.
  - 15.5 percent of injuries involved the eyes.
  - 11.0 percent of injuries involved the leg, foot or toes.
  - 8.0 percent of injuries involved the trunk.
  - 6.0 percent of injuries involved other body parts, including the neck, back and buttock.
- Of the 31 individuals who had eye injuries, three-quarters of those injured (24 cases) did not have or use eye protection (i.e. glasses or contact lenses). Of those who experienced an eye injury, eyeglasses were worn by two individuals and contact lenses were worn by one individual. Eye protection use among four individuals with eye injuries is unknown.

## 2014 FIREWORK-RELATED INJURY REPORT

Figure 10. Body part affected by firework-related injury, Indiana, 2014\*



\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

### Source of Care and Injury Outcomes

- ❑ The majority of people injured by fireworks sought care at an emergency department or urgent care center (99.3 percent). The remaining one case received care from a provider office (i.e. optometrist).
- ❑ 68.1 percent of those seeking treatment were evaluated and released to go home.
- ❑ There were 22 transfers from one hospital to another, most often to a trauma center. One patient was indicated to have been transferred from another hospital. Four cases indicated the patient was admitted to the hospital. Nineteen records did not provide information regarding the patient's outcome.
- ❑ One individual visited three hospitals to be treated for firework-related injuries.
- ❑ There were no firework-related injuries resulting in death reported.

## 2014 FIREWORK-RELATED INJURY REPORT

### Additional Information

#### □ Geographical location

- 68.1 percent of people were injured at a private home, yard or property.
- 19.9 percent were injured at someone else's home, yard or property.
- Public property was noted as the site for nearly five percent of injury occurrences.
- Two people were injured at other, unspecified locations.
- Injury location information was unknown for eight (5.6 percent) cases (Figure 11).

#### □ Alcohol use

- Alcohol use was recorded in 36 instances.
- Alcohol was consumed by 31 injured individuals, and of which 23 cases reported consuming alcohol within three hours of injury. None of those consuming alcohol were under 21 years of age. (Figure 12).

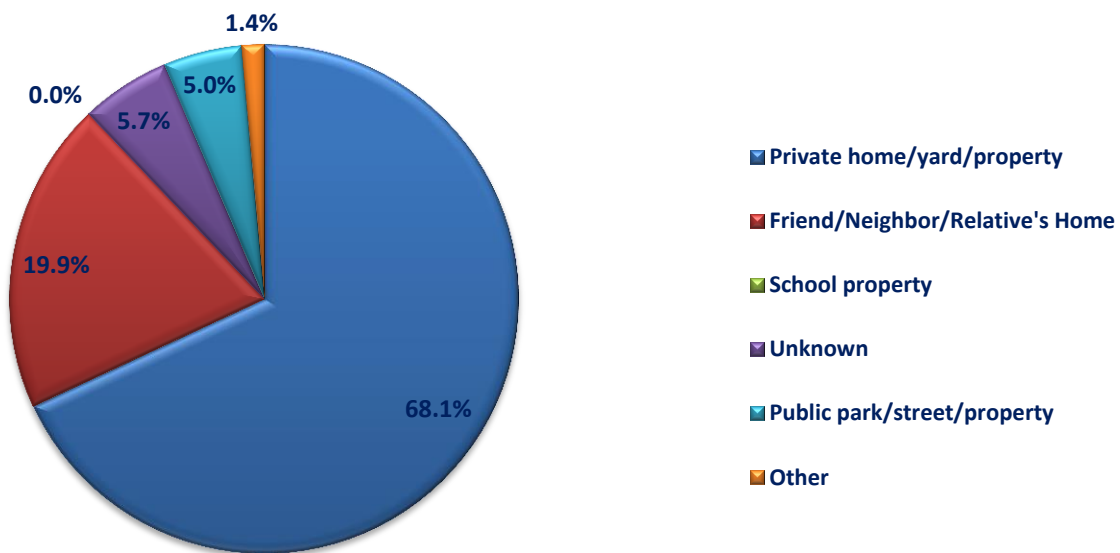
#### □ Adult supervision

- Among the 49 individuals injured who were 18 years of age or younger at the time of the injury, 29 were injured while in the presence of an adult and 8.2 percent had no adult supervision. Information regarding adult supervision was not reported in 16 cases (Figure 13).

#### □ Bystanders

- There were 16 firework-related injuries reported among bystanders, of which nine were 18 years of age or younger.

**Figure 11. Location of firework-related injury, Indiana, 2014\***



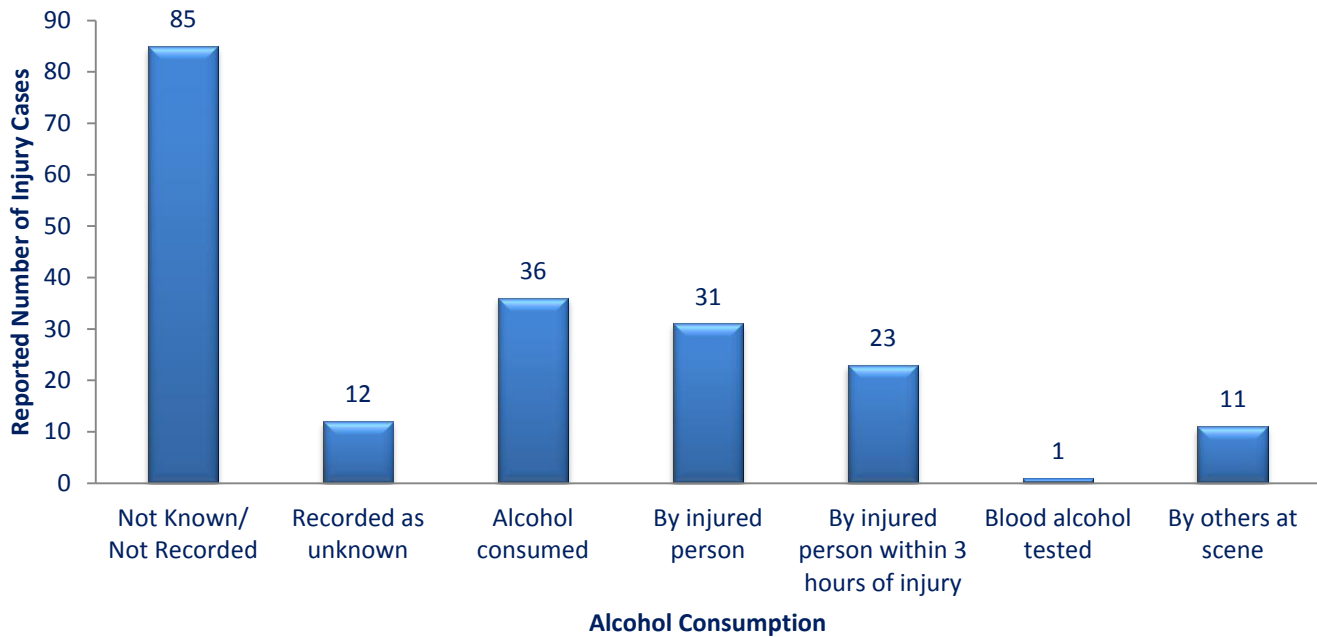
**N=141**

\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

## 2014 FIREWORK-RELATED INJURY REPORT

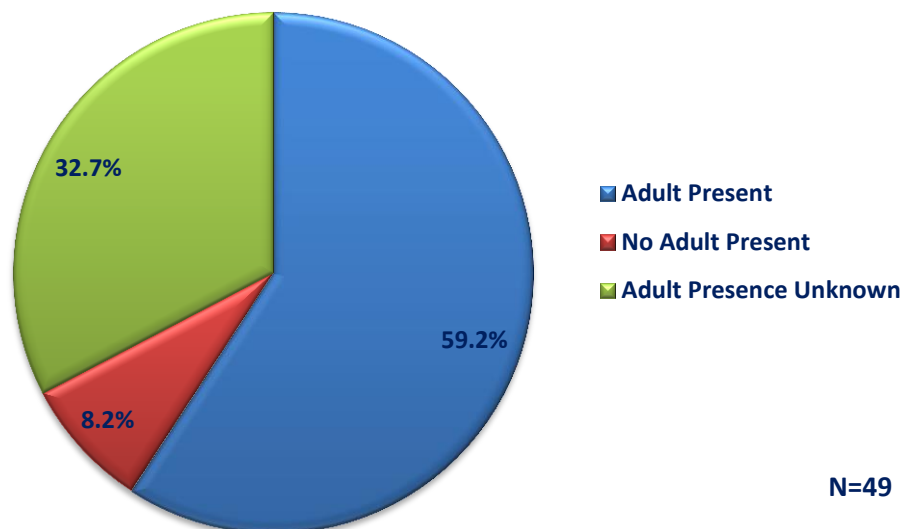
**Figure 12. Alcohol use of those injured by fireworks, Indiana, 2014\***



\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

**Figure 13: Adult supervision of individuals 18 years of age or younger, Indiana, 2014\***



\*2014 reporting cycle included cases from Sept. 13, 2013-Sept. 12, 2014.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

## 2014 FIREWORK-RELATED INJURY REPORT

### Summary of Firework-Related Injuries for 2014

There were 141 unduplicated cases of firework-related injuries reported to the ISDH during the 2014 reporting cycle. There were 18 less cases reported in 2014 compared to the previous year's report. While the ages of those injured ranged from 8 months to 63 years old, children and adolescents comprised nearly a third of reported firework-related injury cases. Males were injured more frequently than females across all age groups and 58.8 percent of all injured persons were white males. More than three-quarters (75.9 percent) of the individuals were white, 12.1 percent were black and four people were multiracial (2.8 percent). Race was not known or not reported for 12 individuals.

More than half (58.5 percent) of the injuries involved the hands, fingers, eyes or arms. Burns were the most common type of injury, occurring in 93 injured persons and affecting 142 parts of the body. The majority (99.3 percent) of people injured by fireworks sought care at an emergency department or urgent care center, with the remaining one cases seeking medical care from another type of provider. Of those seeking medical care, 68 percent were evaluated and released to go home and 18.4 percent were admitted to the hospital or transferred to another hospital.

For the 141 cases of firework-related injuries reported to ISDH during the entire reporting cycle, 75.2 percent occurred between July 1 and July 7 and 48.9 percent of injuries took place on July 4. Sixty-eight percent of injuries occurred on private property. Firecrackers, rockets, and sparklers use resulted in 54.6 percent of firework-related injuries. The mechanism of injury was most commonly malfunction, followed by mishandling of fireworks.

This report has several implications; first, the knowledge of the most commonly affected body parts in firework-related injury can help focus prevention efforts to eliminate injuries. Second, identifying the day and time of most firework-related injuries can help medical personnel better prepare to treat these injuries. Thirdly, this report can help inform policy surrounding which firework types appear to be most dangerous.

There are several limitations of this report, which include the possibility of underreporting and underrepresenting the true burden of firework-related injuries in Indiana because some medical facilities and providers may not report all of their firework injuries to ISDH. It may be because the physician or staff is not aware of the reporting or because the patient does not acknowledge that he was injured by fireworks. Also, there may be some injuries due to fireworks that did not require formal medical evaluation or treatment. Additionally, not every report submitted to the state was completed fully or accurately. Some reports were sent numerous times and this report only contains unduplicated records.

## 2014 FIREWORK-RELATED INJURY REPORT

### APPENDIX

#### Firework-Related Injury Year Comparisons

The Indiana State Department of Health began receiving firework injury reports in 2003 after the collection of this information was mandated by law. After two years, the law expired and no reports were collected in 2005. In 2006, the law was reinstated with requirements identical to the previous law. Table 2 shows the comparison of firework-related injuries for the years in which reporting was mandated (2003, 2004, 2006-2014).

**Table 2. Comparison of firework-related injuries, Indiana, 2003-2004 and 2006-2014**

Year	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014
<b>Number of cases reported</b>	261	233	251	156	141	116	134	141	83	159	141
<b>Demographics</b>											
Median Age	18	18	17	20	21	19	20	21	23	23.5	25
Age Range (in years)	0-74	0-72	0-67	0-70	0-70	0-81	1-69	0-65	2-64	1-78	0-63
Children/Adolescents	53%	52%	55%	48%	50%	50%	47%	42%	36%	41%	32%
Males	73%	76%	70%	67%	70%	72%	75%	72%	87%	70%	75%
Females	27%	24%	30%	33%	30%	28%	25%	28%	13%	29%	23%
White	84%	87%	82%	87%	73%	82%	73%	84%	77%	79%	76%
Black or African American	10%	8%	13%	7%	14%	7%	16%	12%	16%	11%	12%
<b>Injury Type</b>											
Burns	76%	67%	73%	69%	65%	61%	62%	55%	50%	56%	54%
<b>Body Part Injured</b>											
Hand	34%	32%	36%	41%	33%	37%	27%	31%	42%	30%	33%
Eye	17%	25%	29%	24%	21%	16%	17%	18%	13%	17%	16%
No Eye Protection	82%	88%	97%	92%	76%	91%	91%	93%	93%	75%	77%
<b>Injury Circumstances</b>											
Injured on Private Property	83%	89%	86%	83%	87%	84%	79%	67%	61%	60%	68%
Children Injured with Adults Present	60%	50%	64%	61%	62%	41 %	57%	87%	57%	64%	59%
Hospitalized or Transferred to a Hospital	3%	6%	11%	8%	9%	10%	14%	12%	24%	11%	18%
Died	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%
<b>Fireworks Circumstances</b>											
Injuries from Sparklers, Rockets, and Firecrackers	63%	64%	57%	52%	53%	52%	51%	51%	47%	59%	54%
Injuries from Mishandling Fireworks	27%	23%	29%	30%	28%	24%	23%	26%	24%	27%	29%
Errant Path or Malfunctioning Fireworks	21%	37%	41%	35%	40%	41%	43%	43%	37%	44%	14%

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention